ABSTRACT

A method and system can locate an RF transponder based on phase differences between signals transmitted to the RF transponder. The method transmits from a first transponder to a second transponder first and second signals at first and second frequencies, respectively. The second signal is compared with the first signal and a distance between the first and second transponders is determined based on the phase difference between the first and second signals. In one embodiment, the first transponder is an interrogator, the second transponder is an RF tag, and the RF tag determines the phase difference between the two signals. In another embodiment, the first and second transponders are the interrogator and RF tag, respectively, but the interrogator determines the phase difference between the two signals after the two signal are reflected back to the interrogator. The method can also determine a position (distance and direction) of the RF tag by measuring the distances from two different locations of the interrogator to the RF tag. In one embodiment, the two distances are measured from two spaced-apart antennas of the interrogator. In another embodiment, the interrogator is moved from one known location to another known location. With distance measurements from both known locations, the location of the RF tag can be determined by simple geometry.

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